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ABSTRACT

The verbal interaction patterns of selected teachers during a rather structured portion of the reading instruction process were explored. The objectives were (1) to determine if persons identified as above-average elementary classroom teachers of reading differ in these verbal interaction patterns from those identified as beginning teachers during the story-review phase of the Guided Reading Activity (GRA), (2) to determine if above-average elementary classroom teachers of reading have similar verbal interaction patterns, and (3) to develop a conceptual model of the verbal interaction pattern of an above-average elementary classroom teacher during the story-review section of the GRA. Teachers observed were five first-year beginning teachers of grades 3 through 6 and six experienced teachers in the same grades who had been rated as above-average in their teaching of reading skills. Analysis of the data showed no statistically significant difference between the teachers. A bibliography is included. (NH)

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March 1970

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LIST OF DISPLAYS

		Page
DISPLAY 1	Sample Description	6
DISPLAY 2	Summary of Categories for Verbal Interaction Analysis	8
DISPLAY 3	Data Analysis Phases	11
DISPLAY 4	Analysis Scheme	12
DISPLAY 5	Composite Matrix of the Six Experienced Teachers	16
DISPLAY 6	Composite Matrix of the Five Beginning Teachers.	17
DISPLAY 7	Column Percentage Totals and Differences Between The Two Groups of Teachers	18
DISPLAY 8	Ranking of Top Ten Cells Between the Master Composite Matrices of the Beginning and Experienced Teacher Groups	18
DISPLAY 9	A Comparison of the Beginning and Experienced Teachers on the Percentage of Tallies in Each of the 17 Categories	19
DISPLAY 10	A Comparison of Beginning and Experienced Teachers on the Percentage of Tallies in the Four Major Areas of a Matrix and the Student/ Teacher Talk Ratio	20
DISPLAY 11	A Comparison Between Teachers Within the Beginning Teachers Group Using the Kolmogorov-Smirnov Test	21
DISPLAY 12	A Comparison Between Teachers Within the Experienced Teachers Group Using the Kolmogorov-Smirnov Test	22
DISPLAY 13	A Comparison of Beginning and Experienced Teachers S/T Ratios, I.D. Ratios and Revised I.D. Ratios	24
DISPLAY 14	A Comparison of Flexiability Factors Between Beginning Teachers and Experienced Teachers .	25
DISPLAY 15	Mean Percentages of Tallies in Selected Areas of Analysis for the Beginning and Experienced Teachers	27
DISPLAY 16	A Comparison of the Model Variables Between Experienced and Beginning Teachers	29
DISPLAY 17	Ranking of Individual Cells and Their Percentage for Each of the Beginning and Experienced Teachers	30

TABLE OF CONTENTS

		Page
A.	INTRODUCTORY SECTION	1
	Summary	1
	Introduction	3
	Significance of Study and Related Research	3
	Hypotheses/Objectives	5
	Methods	6
	Subjects	6
	Data Collection Procedures	6
	Treatment of Data	10
B.	FINDINGS AND ANALYSIS	15
	Analysis of Master Composite Matrices	15
	Additional Analysis	20
	Other Areas of Analysis	22
	Analysis of S/T Ration, I.D. Ratio and Revised I.D. Ratio, Variables 17, 19 and 20	22
	Analysis of the Flexibility Factors, Variables 18, 29, 30 and 31	24
	Analysis of Selected Areas, Variables 23, 24, 25, 26, 27, 28, 41 and 42	25
	Analysis of Theoretical Conceptual Models, Variables 34, 35, 36, 37 and 39	27
C.	CONCLUSIONS	32
D.	RECOMMENDATIONS	34
E.	APPENDIXES	35
	Appendix A: Verbal Interaction Analysis FORTRAN Program	36
	Appendix B: Analysis Variables	41
	Appendix C: Total Percentages for Each Separate Category for Individual Beginning Teacher	44
	Appendix D: Total Percentages for Each Separate Category for Individual Experienced Teacher	45
F.	REFERENCES	46

INTRODUCTORY SECTION

Summary

This project was designed to explore the verbal interaction patterns of selected teachers during a rather structured portion of the teaching of reading process. The objectives for the project were:

1. To determine if persons who have been identified as above-average elementary classroom teachers of reading differ in their verbal interaction patterns from those identified as beginning teachers during the "story review" phase of the Guided Reading Activity.

2. To determine if above-average elementary classroom teachers of reading have similar verbal interaction patterns.

3. To develop a conceptual model of the verbal interaction pattern of an above-average elementary classroom teacher during the story review section of the GRA.

Two groups of teachers were selected. One group consisted of five first year beginning teachers of grades three through six. The other group had six experienced classroom teachers in grades three through six, who had been rated as above-average in their teaching of reading skills by their building administrators.

Each of the eleven teachers were observed three times by the same observer while they were carrying on the "story review" phase of the Guided Reading Activity. The data from the observations was collected by using a modification of the Flanders Verbal Interaction Analysis system. The original categories of Flanders were supplemented with seven additional categories related to the teaching of reading and elementary school age children.

This data was collected over a relative short period of time and before the teachers had the opportunity to get feedback on their verbal behavior from the matrices; thus attempting to prevent the teacher from changing his normal verbal interaction patterns.

The analysis of the data was performed in four phases. First, the three individual matrices for each teacher was constructed and analyzed through the use of a Fortran IV computer program. Next, the three matrices for each teacher were consolidated to make a composite matrix for each of the eleven teachers. These eleven matrices were then examined for likeness and differences. The third analysis phase was to combine the matrix for each teacher in the same group. This phase provided data in the form of two master composite matrices, one made up of five beginning teacher's matrices

and one from the six above-average teacher's matrices. These two master composite matrices were then compared. The final phase was the statistical comparison of the two master matrices using the Kolmogorov-Smirnov test for significant difference.

The analysis of the data showed there was no statistically significant difference between these two groups of teachers. An analysis of each of the 17 categories in the two master composite matrices also produced no significant differences. As a result of these findings it was not possible to proceed with the development of a conceptual model which could be used to train teachers to improve their teaching of reading skills.

The most commonly used verbal interaction pattern was the same for both groups of teachers. The following was the most common sequence of verbal interaction behavior: 40 - 9 → 9 - 9 → 22 - 9 → 9 - 22 → 9 - 2 or 9 - 3. In the verbal interaction terms this becomes: Teacher asks broad questions which allow students freedom of expression or higher thought level responses (40); then the student responds with an indepth response and continues to talk for an extended period of time exceeding three seconds in length (9-9); then another student talks without having to be prompted by the teacher; thus producing a free interchange of ideas and a student centered discussion (9-22, 22-9); then the teacher either praises the students for their responses (2) or accepts their ideas and uses them in the reading lesson.(3)

Several trends were found in the data collected. Experienced teacher's matrices had more Student Talk type behaviors and particularily in category 9, Student Initiated Talk. During the time the beginning teachers were talking, they utilized a slightly more indirect approach in the verbal behaviors. These beginning teachers also made greater use of category 4, Asking Narrow Questions, than did the experienced teachers.

When a within group analysis was made of the two groups, independent of one another, there seemed to be a wider range in the teaching styles of beginning teachers. Only one of the experienced teachers was significantly different from the other experienced teachers. This difference from the other teachers in this group was due to an increase in the amount of Teacher Talk and a decrease in Student Talk categories.

Further studies of this nature should be continued. Possible changes should be made by increasing the sample size, using a different criteria for selection and identification of above-average classroom teachers of reading such as peer nomination procedures or trend line data analysis of student achievement scores, etc., or use of theoritical conceptual models to teach with and measurement of student achievement related to the use of these conceptual models.

Introduction

This study was designed to examine the verbal interaction patterns between students and teachers during the "story review" phase of the Guided Reading Activity in grades three through six. An attempt was made to compare the verbal behavior of two types of teachers; beginning teachers and experienced teachers rated as above-average classroom reading teachers by building administrators, during this teaching activity. If a similar verbal interaction pattern related to above-average reading teachers could be identified, then a conceptual model of this behavior might be constructed and taught to other teachers either in preservice or inservice sessions.

Significance of Study and Related Research

In March of 1967, Leo Fay, President of the International Reading Association and reading authority, summarized the use of the "Basic Reading Series Approach" by stating:

> "A recent estimate suggests that over 90 per cent of the elementary classrooms in the United States use a basic reading series as the foundation for their reading instruction." (Anderson, 1968)

Almost all of these basic reading series use a similar lesson plan organization. This plan usually consists of four phases:

I. Preparation or Readiness for Reading
II. Silent Reading
III. Story Review, Interpretation and Oral Rereading
IV. Follow-up, Enrichment and Extension of Skills

This organization is often referred to as the Guided or Directed Reading-Learning Activity. In this study, the term Guided Reading-Learning Activity (GRA) will be used. The major emphasis will be on Phase III, Story Review of the GRA. It is during this segment of the reading lesson that comprehension skills, critical reading skills and analysis of individual students reading problems are stressed.

The type of interaction that takes place during the "Story Review" section of the GRA is mainly verbal communication between students and their teacher. Inasmuch as this is a time of active verbal interaction; then a situation of this nature can lend itself to analysis. The Flanders Interaction Analysis system is one which fits this criteria.

For this project to have educational significance and general application, three basic assumptions are made:

I. The Guided Reading-Learning Activity is the foundation of most basic reading series and is a system of reading instructions used in a great number of classrooms throughout the United States. (Anderson, 1968; McKee, 1966; Tinker, 1962; Heilman, 1961)

II. Different types of teachers; superior, average, poor, indirect-direct, etc. do differ in their verbal behavior and interaction analysis. (Amidon and Giammatteo, 1965; Flanders, 1965; Furst, 1962; Fine, 1967; LaShier, 1967; Amidon and Powell, 1966; Amidon and Hough, 1967)

III. Student achievement is related to certain types and patterns of verbal interaction behavior. (Flanders, 1964, 1965; Soar, 1968; Amidon and Hough, 1967; Amidon and Giammatteo, 1965)

Flanders (1965) showed that teachers who used an indirect teaching style produced higher achievement and better student attitude. Amidon and others (1967) has reconfirmed this assumption. Amidon and Giammatteo (1965) in their study of verbal behavior of superior elementary teachers have shown that the verbal interaction patterns of these teachers do differ substantially from those of average teachers.

Furst and Amidon (1965) carried out a study in grades one through six to determine if verbal interaction patterns differ at the various grade levels during the reading lessons. Bogeners' (1967) study on VIA showed there was a difference in verbal patterns between seven independent approaches used to teach reading; grouping, individualized, etc. Morrison's (1968) study examined three approaches to reading using the Revised Observer Schedule and found that the "same test for every pupil" was associated with a decrease in student-teacher interaction while multi-level and enrichment classroom reading approaches increase positive verbal patterns between teachers and students.

A.Sterl Artley (1969) in a recent article on improvement of reading instruction states: "...to improve pupil achievement in reading one should look first at the teacher and his training." He further states:

> "It is not until we have seen the results of teacher characteristics or interaction, or behavior, or whatever, on pupil development that we will have something that we can use in teacher education."

A number of other educators have also indicated the need for concentrating on the "teacher" in reading, rather than the method of reading. Some of these comments are:

> "Recent research has amply demonstrated that the difference among teachers are far more important than differences among methods and materials in influencing the reading achievement of children." Albert Harris (1969)

"...teacher is far more important than the method. It is recommended, therefore, that in-service workshops and expert consultive help be provided for all teachers and especially for those with minimal experience." Harris and Morrison (1969)

"The thing that the study probably illustrates more clearly is that the influence of the teacher is greater than that of a particular method, a certain variety of materials, or a specific plan of organization. Given a good teacher other factors in teaching reading tend to pale insignificance." W. S. Ramsey (1962)

"With regards to reading methods and material... no one approach is so distinctly better in all situations... To improve reading instruction, it is necessary to train better teachers of reading rather than to expect a panacea in the form of materials." Bond and Dykstra (1967)

Hypotheses/Objectives

The objectives of this project are:

1. To determine if persons who have been identified as above-average elementary classroom teachers of reading differ in their verbal interaction patterns from those identified as beginning teachers during the story review phase of the Guided Reading Activity.

2. To determine if above-average elementary classroom teachers of reading have similar verbal interaction patterns.

3. To develop a conceptual model of the verbal interaction pattern of an above-average elementary classroom teacher during the story review section of the GRA.

Essentially, the primary purpose of this study is to construct this conceptual model. If there is a significant difference in the verbal interaction of these two types of teachers and if there is a common reoccurring verbal pattern in the superior reading teachers, then it should be possible to develop this conceptual model.

In light of what Flanders, Amidon and others are saying about changes in the teaching techniques of individuals with awareness of and/or training in the verbal interaction analysis system, then it should be realistic to think that once a conceptual model of a superior teaching technique has been identified, then teachers can be trained to duplicate this model in their classroom reading activity. Through pre-service or in-service education, a teacher could learn factors and phases of this model and incorporate them in their own teaching. This teaching style should then in turn result in greater student reading achievement and attitude.

Methods

Subjects

The subjects were eleven classroom teachers in grades 3 through 6 in the Shawnee Mission Public Schools. Of the eleven teachers, 6 were above-average, experienced teachers and 5 were beginning teachers. Display 1 indicates the grade level taught and sex breakdown of the eleven teachers.

DISPLAY 1

SAMPLE DESCRIPTION

	Beginning	Experienced
Grade 3	3 Females	2 Females
Grade 4	1 Female	1 Female
Grade 6	1 Male	1 Male
		2 Females

The selection of subjects for the study was made jointly by the elementary school principals and the project investigator. Beginning teachers were those just graduated from universities and in their first semester of teaching experience. The experienced teachers group was selected on the basis of principal recommendation. The principals were given the following definition of an above-average classroom reading teacher to guide their recommendations for participants:

a. identifies well with her students
b. organizes her classroom enviornment to provide for individual differences in her students
c. is concerned with the reading progress of each of her students
d. attempts to make reading meaningful
e. is flexible in her teaching techniques
f. demonstrates in practice and discussion above-average knowledge of child psychology, learning theories, and the teaching of reading

The eleven teachers were located in six different elementary schools. None of the experienced teachers observed were teaching in buildings where beginning teachers were observed.

For the remainder of this project report, these above-average classroom reading teachers will be referred to as "experienced teachers."

Data Collection Procedures

Each teacher was observed three separate times. The observations varied in length of time between 8 minutes to 46 minutes, with the

average length of observation being 22 minutes.

Each observation was made during the same type of teaching activity, the "story review" phase of the Guided Reading Activity. The "story review" phase is that activity which consists of the discussion of a story that has been read either silently or orally.

All observations for any one teacher were made with a period of three consecutive weeks. The investigator did not discuss the results of the data collected during these observations until all three observations had been made.

The teachers were asked to schedule observations during a time when they would be working with students who were not extremely different readers. This request eliminated groups of children who were extremely high or extremely low in their reading performance and achievement. The size of these groups varied from 5 students to 24 students, with the average group size being 10 students.

A modification of the Flanders Verbal Interaction Analysis system was used to collect the data on student-teacher interation during the observations. The modifications to the original system were developed as the result of actual classroom feedback experience. The first change was to separate category 10, silence and confusion into two categories. After the original Flanders had been used in an interview situation with teachers, it was found that when this category appeared, it was felt by the teachers to indicate confusion. As the number of interviews increased, the emotional tone towards category 10 became more prevalent. To reduce this emotional stress, it was decided to separate these two categories and thus category 33 is used to indicate silence and category 44 indicates confusion. Another modification was a result of the desire to show some form of student independence in a discussion situation. If in a discussion, the students interacted without the aid of the teacher directing them, the original Flanders would only show a series of 9-10-9's or 8-10-8's. To allow the observer to show this student change of speakers and not confuse the recorded 10's as silence or confusion, another category was added; category 22, entitled "Student Interchange". On the other end of the spectrum for this type of activity, class discussions, where the teacher has to direct the students to talk by calling on them by name, another category was added; indicated by the number 11, entitled "Student Name". This classification is often referred to as the "gate keeper" function of the teacher, where her only verbal interation is simply to call the student's name and the student must respond to a previously stated direction, question or other student response.

This modified instrument was used during the fall of 1968 to observe the teaching of reading in grades 1 through 6. During this time it was discovered that several categories were being relied on quite heavily by the teachers during the Guided Reading Activity. The teachers were asking questions (category 4), giving directions (category 6), accepting and rejecting student response (categories 2, 3 and 7), and having the students reading aloud (category 8).

It was decided to expand some of these categories to get a more in-depth analysis of the reading lesson.

To expand category 4, "Asking Questions", Amidon's (1967) modification using Cognitive Memory, Convergent, Divergent and Evaluative questions was field tested. This system was found to be too definitive and cumbersome to use for the elementary grade classrooms. Amidon and Hunter's (1966) VICS system was tried out in the classroom. From this system the Narrow and Broad Questions categories were incorporated into the modification.

When giving directions, the teachers used basically two types. One type allowed the student to read something that held specific meaning for him, something of a personal nature; such as "Read the part you liked best, is the funniest, etc." The other type required the students to find a very definite answer or phrase similar to the cognitive memory question responses. These two categories were consequently separated into category 60, "Giving Nonrestrictive Directions" and category 6, "Giving Restrictive Directions".

Another modification was to add to category 7, "Criticizing or Justifying Authority", another category 70, "Corrective Feedback", to show whenever the teacher corrects or rejects a student's response.

The last modification was to add a third category to Student Talk. This category was to show when a student was reading orally, category 80, "Oral Reading by Student".

The procedures for using the Verbal Interaction Analysis system was basically the same as described in Amidon and Flanders (1963) manual The Role of the Teacher in the Classroom. See Display 2 for the Summary of Categories for Verbal Interaction Analysis.

DISPLAY 2

SUMMARY OF CATEGORIES FOR VERBAL INTERACTION ANALYSIS

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11. Gate-Keeper: teacher directs a student to response by calling student's name, no other words are spoken by the teacher, students must make reference back to previous question, task or discussion.

1. Accepts Feeling: accepts and clarifies the feeling tone of the student in a nonthreatening manner. Feelings may be positive or negative. Predicting or recalling feelings is included.

2. Praises or Encourages: praises or encourages student action or behavior. Jokes that release tension, but not at the expense of another individual; nodding head, or saying

"um hum" or "go on" are included.

3. Accepts Or Uses Ideas of Students: clarifying, building, or developing ideas suggested by a student. As teacher brings more of his own ideas into play, use 5's.

4. Asks Narrow Questions: asking a question about content or procedure with the intent that a student answer. If the general nature of the response can be predicted, such as drill questions or questions requiring one word, or yes or no answers.

40. Asks Broad Questions: asking relatively open-ended type questions, thought-provoking or ones requiring expressions of opinions or feelings; usually will be followed by long answers.

5. Lecturing: giving facts or opinions about content or procedures; expressing his own ideas, asking rhetorical questions.

6. Giving Restrictive Directions: directions, commands, or orders which a student is expected to comply and is followed by a specific predictable student behavior. example: Read me the part of the story which tells what color the dog was.

60. Giving Nonrestrictive Directions: directions, commands or orders which a student is expected to comply with, but of a nature where the student has a choice, particularly in oral rereading situation where the teacher directs the student to read a section of the story which holds special interest to the individual. Example: Read me the part of the story you liked best or was the funniest to you.

7. Criticizing or Justifying Authority: statements intended to change student behavior from nonacceptable to acceptable pattern; bawling someone out; stating why the teacher is doing what he is doing; extreme self-reference.

70. Correcting a Student's Wrong Verbal Response: that is the wrong answer

8. Student Talk-Response: talk by students in response to teacher. Teacher initiates the contact or solicits student statement.

80. Oral Reading by a Student:

9. Student Talk-Initiation: talk by students, which they initiate. If "calling on" is only to indicate who may talk next, observer must decide whether student wanted to talk. If he did, use this category.

22. Student Interchange: one pupil responds to another student, statements between students which are not solicited.

33. Silence: pauses, short periods of no verbal interaction.

44. Confusion: periods of confusion when communication cannot be understood

---

Treatment of Data

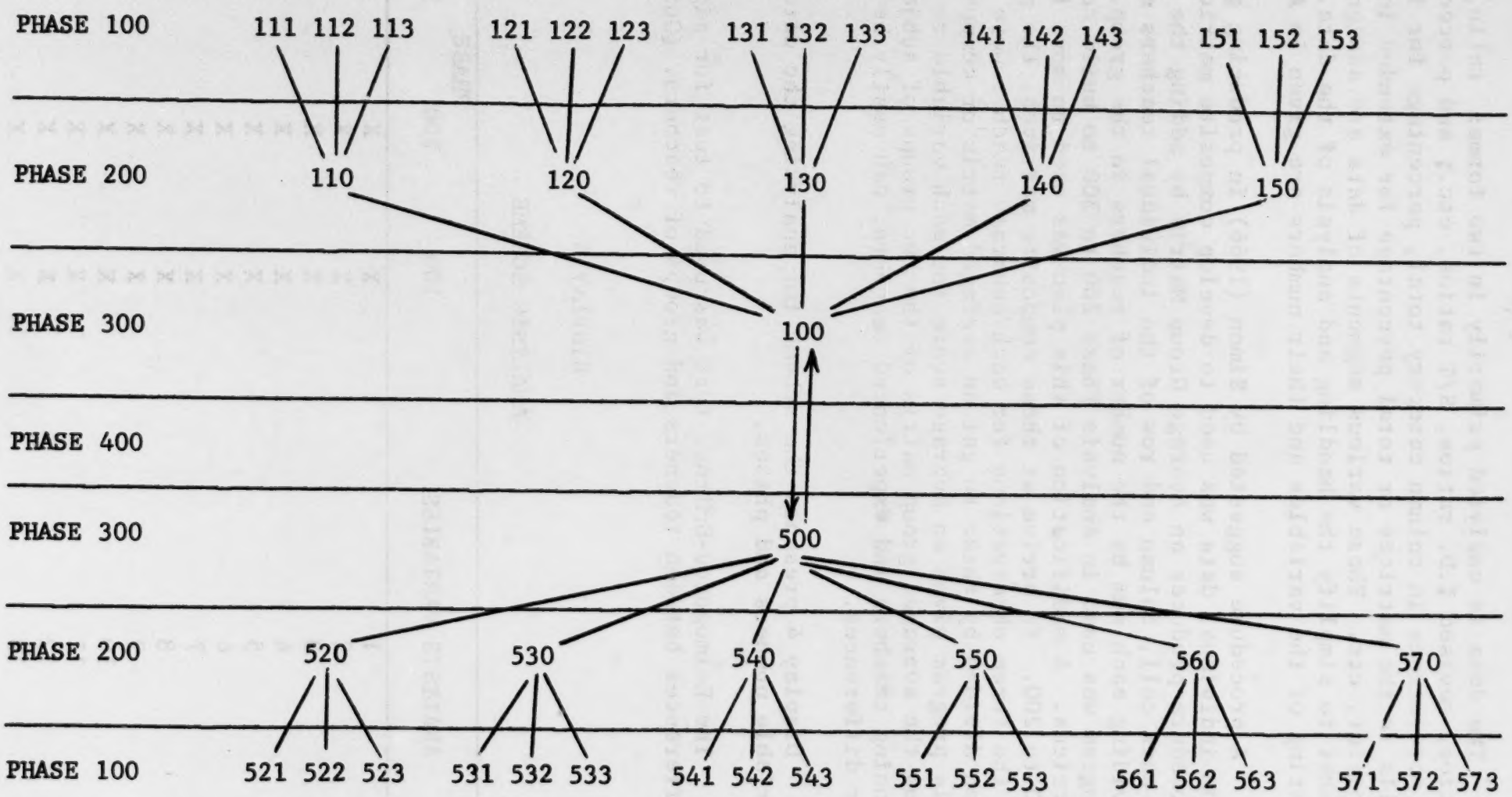
One of the problems in using a verbal interaction analysis system was the combining of the data into a form to make comparisons. At least one tally was made every three seconds during the period of observation, and these tallies must be built into a matrix before data analysis can occur. Building the matrices is a time consuming process and for this study 33 individual matrices had to be developed. In addition eleven composite matrices were built from the 33 and 2 master composite matrices were developed from the eleven composite matrices. To facilitate the handling of this data, a Fortran IV program was written to build matrices and do some of the other data analysis. See Appendix A for Fortran IV program. The data was transferred from the observer's string tally form to a form used by keypunch operators to prepare the IBM punched cards. This data was then fed into an IBM 360/40 computer system for data analysis.

To facilitate the handling of the data for the various teachers involved a teacher coding system was devised. This system assigned a three digit number to each teacher and each observation. Beginning teachers were assigned 100 series numbers, experienced teachers were assigned 500 series numbers. The five beginning teachers' numbers were 110, 120, 130, 140 and 150. The six experienced teachers' numbers were 520, 530, 540, 550, 560 and 570. The third digit in each number was used to denote the sequence of observation. In a typical code number, such as 562, the first digit (5) indicates it is an experienced teacher, the second digit (6) indicates a particular teacher, and the third digit (2) indicates it was the second observation for that teacher.

The data analysis was organized to be carried out in 4 phases. Phase 100 was the building of matrices and data analysis for the 33 separate observations. Phase 200 was the first compiling phase when the three observations for each teacher were developed into a composite matrix for each teacher. Phase 300 was the second compiling stage when all of the beginning teachers matrices were combined to form one master composite matrix and all the experienced teachers matrices were combined to form another master composite matrix. These two master composite matrices, one for beginning teachers and one for experienced teachers, were then compared statistically in the final phase, Phase 400. A graphic illustration of these phases of analysis is presented in Display 3.

DISPLAY 3

DATA ANALYSIS PHASES



The data is analyzed primarily in two forms: ratio, such as I.D. ratios, revised I.D. ratios, S/T ratios, etc.; and percentages, such as percentages in column category total, percentage for individual cells in the matrices or total percentage for extended indirect behavior, etc. These various segments of data are assigned a variable number to simplify the handling and analysis of the data. A complete listing of the variables and their numbers are given in Appendix B.

A procedure suggested by Simon (1966) in producing group data from individual data was used to develop composite matrices. This procedure produces an Average Group Matrix by adding the percentages in each cell, column and row of the individual teachers matrix and dividing each sum by the number of teachers in the group. This program was used in Analysis Phase 200 to 300 to build composite matrices. A modification of this plan was used to move from Phase 100 to 200. To arrive at these composite matrices, the percentages of the three observations for each separate teacher were added and then divided by three to get an averaged matrix or composite matrix. This program gives an average score for each variable to be compared. Thus the averaged group matrix of the two groups of subjects, beginning teachers and experienced teachers, can easily be inspected for differences.

Display 4 presents the scheme for analyzing the data by variable numbers and phases.

The Kolmogorov-Smirnov test was used to test for significant differences between teachers and groups of teachers. (Guilford 1965)

DISPLAY 4

ANALYSIS SCHEME

ANALYSIS VARIABLES	PHASE 100	200	300	400
1	X	X	X	
2	X	X	X	
3	X	X	X	
4	X	X	X	
5	X	X	X	
6	X	X	X	
7	X	X	X	
8	X	X	X	
9	X	X	X	
10	X	X	X	
11	X	X	X	
12	X	X	X	
13	X	X	X	
14	X	X	X	
15	X	X	X	
16	X	X	X	

ANALYSIS VARIABLES	PHASE 100	200	300	400
17	X	X	X	
18	X	X	X	
19	X	X	X	
20	X	X	X	
21	X	X	X	
22	X	X	X	
23		X	X	
24		X	X	
25		X	X	
26		X	X	
27		X	X	
28		X	X	
29		X	X	
30		X	X	
31		X	X	
32		X	X	
33	X	X	X	
34		X	X	
35		X	X	
36		X	X	
37		X	X	
38		X	X	
39		X	X	
40	X	X	X	
41		X	X	
42		X	X	
43		X		
44	X	X	X	
45				X
46				X
60	X	X	X	
70	X	X	X	
80	X	X	X	

The following is a summary of the data analysis as it is related to the project objectives:

Project Objective 2

Phase 100. Construct individual percentage matrices for each observation session. A percent matrix has the percentage of time spent in that activity for each cell instead of the raw tallies in each cell: (33 Matrices)

1. To be used in the post interview situation with the teachers.
2. To be used for identifying common patterns for each teacher.

Phase 200 and 400. Construct composite percentage matrices of the three observations for each teacher: (11 Matrices)

Project Objective 2

1. To identify differences in verbal interaction patterns between above-average and beginning teachers. This examination would be of the "between and within" group nature. The Kolmogorov-Smirnov test will be used for this analysis.

Project Objectives 1 and 3

2. A Mann Whitney U will be computed for each of the 17 categories to test for significant differences between the two groups of teachers. This information will help in determining major category differences between the above-average and beginning teacher. It will guide in the selection of cells and categories for the conceptual model development.

Project Objective 3

Phase 300 and 400. Construct a composite percentage matrix for the above-average teachers and a composite percentage matrix for the beginning teachers: (2 Matrices)

1. To test for significant differences between the two groups of teachers, the Kolmogorov-Smirnov test will be used.

FINDINGS AND ANALYSIS

Analysis of Master Composite Matrices

In Analysis Phase 400, the two master composite matrices were compared by using the Kolmogorov-Smirnov Test of Goodness of Fit. The cumulative distribution of the 17 categories of the beginning teachers (Teachers Code 100) was compared with those of the experienced teachers (Teacher Code 500). The K-S test D value for these two groups was .0838. When substituted in the Chi square estimate formula

$$\chi^2 = 4D^2 \frac{N_1 N_2}{N_1 + N_2}$$ the χ^2 was

equal to 1.4044. This value was not significant. The data for this study indicates there was not a significant difference between the verbal interaction patterns of above-average teachers of reading and beginning classroom teachers. Due to this lack of significant difference no attempt was made to develop a conceptual model.

Display 5 shows the master composite percentage matrix for the six experienced teachers. Display 6 shows the master composite percentage matrix for the five beginning teachers. Display 7 gives a column breakdown between the two groups and the difference in percentage points.

An examination of the column totals for the two groups indicates that in only three categories are there differences of greater than 3 percentage points. The three categories that do differ are:

A. Category 4 - Teacher Asking Narrow Questions
In this category the beginning teachers asked more narrow questions. There was 3.74% points between the two groups.

B. Category 9 - Student Initiated Talk
In this category the experienced teachers provided the students with more of the opportunities to express their own ideas. Between the two groups there was only 5.83% points difference.

C. Category 8 - Student Talk-Response
The beginning teachers had students responding in this form more often. A difference of 3.17% points.

The individual cells are compared in the two composite matrices in Display 8. Each cell was ranked as to frequency of occurrance. As seen in Display 8 in the ranking of the top 10 cells for each group of teachers; in the first 9 rank positions the same cells appear in both groups. These 9 cells are not in the same sequence for both groups but they all appear. It is only at the tenth rank position that a different cell appears on one list that does not appear on the other list. These top ten cells constitute 52.40% of all of the tallies of the beginning teachers and 56.93% of the tallies of the experienced.

DISPLAY 5

COMPOSITE MATRIX OF THE SIX EXPERIENCED TEACHERS*

Cat.	11	1	2	3	4	40	5	6	60	7	70	8	80	9	22	33	44
11							.02			.01		.18	.08	1.63		.06	
1	.01	.02		.02	.03	.02	.05	.01	.01			.04	.02	.03			
2	.27		.07	.33	1.40	.97	.88	.50	.04			.07	.05	.91		.07	
3	.23	.02	.02	.60	.35	.63	.59	.06						.71		.01	
4		.01			.54	.04	.11	.07				6.01	.04	.21		.09	
40				.04	.17	1.49	.22	.05	.01	.01	.01	.41	.01	4.60		.09	
5	.13			.08	.13	.76	3.88	.65	.06	.03		.02	.08	1.36		.09	
6			.02	.02	.27	.15	.22	1.47				.18	.64	.60		.48	
60	.01					.01	.01		.11			.02	.05	.03		.04	
7					.11	.02	.05	.05	.01	.20		.01	.02	.14		.01	
70	.08				.16	.10	.01	.03	.01		.03	.03	.07	.11			.01
8.	.21		2.72	.28	1.21	.44	.33	.37	.02	.02	.20	.93	1.20	.22	.51	.07	
80	.02		.29	.04	.17	.10	.14	.23			.11	.08	5.62	.21	.01	.01	
9	.54	.20	2.51	1.81	1.39	1.94	1.68	.53	.03	.23	.32		.21	21.29	3.74	.20	.04
22												.10		4.15			
33	.08	.02		.02	.36	.11	.24	.11				.03	.07	.24		2.41	.01
44								.02		.01							
Total	1.58	.26	5.64	3.22	6.29	6.78	8.43	4.15	.30	.51	.67	8.11	8.16	36.44	4.26	3.63	.06

* N = 9,541 tallies. All numbers in the matrix represent percentage of N.

DISPLAY 6

COMPOSITE MATRIX OF THE FIVE BEGINNING TEACHERS*

Cat.	11	1	2	3	4	40	5	6	60	7	70	8	80	9	22	33	44
11												.89	.08	2.07		.01	
1	.03		.02		.05		.08	.03						.03		.02	
2	1.23	.02		.33	2.60	1.17	.78	.50	.03	.02		.16	.11	.91		.15	
3	.37		.09	.50	.71	.80	.53	.25						.45		.10	
4	.02				1.22		.14	.17		.03		8.16	.07	.21		.31	
40					.09	1.02	.10	.02				.07		4.09		.22	
5	.23			.03	1.44	.51	4.27	.60	.02			.07	.02	1.14		.23	
6	.07		.02		.39	.08	.33	1.25				.25	.43	.32		.68	
60									.03					.02		.03	
7	.02		.02		.11		.07	.06		.12				.07			
70	.13				.14	.11	.13	.02					.07	.18		.03	
8	.17		4.30	.83	1.47	.57	.45	.33		.10	.37	1.49	.04	.31	.74	.13	.02
80			.28	.01	.12		.06	.19		.01	.05		4.35		.71	.07	
9	.55	.25	3.12	2.21	1.18	1.04	1.19	.33		.21	.37	.01	.09	13.79	4.39	.16	.10
22												.12	.71	5.03			
33	.27		.14	.01	.51	.28	.25	.21				.11	.05	.31		.55	
44										.11				.02			
Total	3.09	.27	7.99	3.92	10.03	5.58	8.38	3.96	.08	.60	.79	11.28	6.02	29.04	5.84	2.69	.13

*N = 6,468 tallies. All numbers in the matrix represent percentage of N.

DISPLAY 7

COLUMN PERCENTAGE TOTALS AND DIFFERENCES
BETWEEN THE TWO GROUPS OF TEACHERS

Category	Code 100 Beginning Teachers N=5 %	Code 500 Experienced Teachers N=6 %	Differences Between Column Percentage Totals
11	3.09	1.58	1.51
1	.27	.26	.01
2	7.99	5.64	2.35
3	3.92	3.22	.70
4	10.03	6.29	3.74
40	5.58	6.78	1.20
5	8.38	8.43	.05
6	3.96	4.15	.19
60	.08	.30	.22
7	.60	.51	.09
70	.79	.67	.12
8	11.28	8.11	3.17
80	6.02	8.16	2.14
9	29.04	36.44	7.40
22	5.84	4.26	1.58
33	2.69	3.63	.94
44	.13	.06	.07

DISPLAY 8

RANKING OF TOP TEN CELLS BETWEEN THE MASTER COMPOSITE MATRICES
OF THE BEGINNING AND EXPERIENCED TEACHER GROUPS.

Beginning Teacher		Experienced Teacher	
Cell	Percentage	Cell	Percentage
9-9	13.79	9-9	21.29
4-8	8.16	4-8	6.01
22-9	5.03	80-80	5.62
80-80	4.35	40-9	4.60
9-22	4.39	22-9	4.15
8-2	4.30	5-5	3.88
5-5	4.27	9-22	3.74
40-9	4.09	8-2	2.72
9-2	3.12	9-2	2.51
2-4	2.60	33-33	2.41

This great similarity of cell sequence indicates why it would be difficult to develop a conceptual model of verbal behavior of experienced teachers. There is no significant difference between the two groups of teachers.

As seen in Display 9 when each of the 17 categories were compared statistically using the Mann Whitney U test, there were no significant differences. The only category which could be sonsidered significant, if the criteria of significance was changed to .10 level, would be category 4, Asking Narrow Questions. This significance would be in favor of the experienced teachers in that their use of this category was less than beginning teachers.

DISPLAY 9

A COMPARISON OF THE BEGINNING AND EXPERIENCED TEACHERS ON THE PERCENTAGE OF TALLIES IN EACH OF THE 17 CATEGORIES

Variable Numbers	Range of Percentages Beginning Teachers	Experienced Teachers	Mann Whitney Test Level of Probability
11	.14 - 5.40	.50 - 2.90	.330
1	.07 - .63	.00 - .70	.792
2	4.40 -12.14	2.34 - 8.67	.428
3	2.10 - 5.57	1.87 - 4.43	.662
4	8.70 -13.19	4.02 - 9.97	.052
40	3.50 - 8.83	3.59 -11.39	1.000
5	5.74 -14.04	4.51 -13.86	.662
6	1.24 - 7.10	1.74 - 6.41	1.000
60	.00 - .34	.00 - .70	1.000
7	.00 - 1.17	.07 - 1.34	1.000
70	.00 - 1.60	.17 - 1.54	.930
8	10.54 -13.64	4.36 -12.00	.178
80	.77 -15.24	.16 -16.97	1.000
9	14.07 -36.71	24.24 -48.99	1.000
22	2.24 -10.74	1.24 - 6.54	.428
33	.84 - 4.67	.77 - 9.10	.662
44	.00 - .40	.00 - .14	.662

Display 10 indicates the range of percentages for the 11 composite matrices developed for analysis Phases 200. The S/T ratio cited in this display is the ratio of total tallies in the teacher talk categories divided into the total tallies in the student talk categories. These ratios and the range of percentages in Student Talk would indicate that the experienced teachers had more student talk in their reading lessons. An S/T ratio over 1.00 indicates there was more student talk than teacher talk. In the beginning teacher group only 2 of the 5 had S/T ratios over 1.00, whereas in the experienced teacher

DISPLAY 10

A COMPARISON OF BEGINNING AND EXPERIENCED TEACHERS ON THE PERCENTAGE OF TALLIES IN THE FOUR MAJOR AREAS OF A MATRIX AND THE STUDENT/TEACHER TALK RATIO

Variable Description and Numbers	Range of Percentages Beginning Teachers	Experienced Teachers
Teacher Talk-Indirect (V#12)	21.88 - 36.72	17.94 - 30.34
Teacher Talk-Direct (V#13)	11.92 - 17.44	9.90 - 18.57
Total Teacher Talk-(V#14)	36.17 - 50.53	30.36 - 47.01
Student Talk-(V#15)	42.95 - 50.33	48.47 - 64.51
S/T Ratio	.85 - 1.39	1.03 - 1.82

group all six of the teacher's S/T ratios were over 1.00. Again these differences were not significant.

Additional Analysis

Due to the lack of significance of differences between the two groups of teachers any additional analyses would have to be considered as statements related to general trends. These trends are of value in that they can lead us to a better understanding of how individual teachers handle the "story review" phase of the Guided Reading Activity. For this reason most of the following analysis are carried on using data in Analysis Phase 200. In this phase each of the three observations for the individual teachers were combined to form a composite matrix for that particular teacher. This provided five matrices for the beginning teachers and six matrices for the experienced teachers.

When the Kolmogorov-Smirnov test was computed comparing one individual teacher in the same group; such as teacher 110 vs. teacher 120; some interesting results emerged. Displays 11 and 12 show the results of the K-S test.

As can be seen in Display 11, the beginning teachers exhibited some significant differences within their group. All five teachers differ significantly with the other teachers at least once. Two of the teachers, teacher 140 (Female-3rd grade teacher) and teacher 150 (Male-6th grade teacher) showed a difference in verbal pattern twice each with other teachers and between theirselves.

DISPLAY 11

A COMPARISON BETWEEN TEACHERS WITHIN THE BEGINNING TEACHERS GROUP USING THE KOLMOGOROV-SMIRNOV TEST.

Teacher Number:	Teacher Number	Chi square value From K-SD	Level of Significance
110	120	.494	N.S.
110	130	5.146	N.S.
110	140	6.266	.05
110	150	7.872	.05
120	130	4.917	N.S.
120	140	5.094	N.S.
120	150	7.589	.05
130	140	13.950	.01
130	150	1.556	N.S.
140	150	24.823	.01

Teacher number 140, a third grade female teacher, had the highest percentage of the Indirect Teacher Talk (36.72%) of the five beginning teachers. In the indirect teacher talk categories she had high in Category 4, Asking Narrow Questions (13.19%) and high Category 2, Praises and Encourages (10.58%) and Category 3, Acceptance of Student Idea (5.33%). She also had the group's highest percentage in Total Teacher Talk (50.53%) and the group's lowest percentage in Category 9, Student Talk-Initiation by Student (14.07%) and Total Student Talk (42.95%). See Appendix C for the category totals of all of the beginning teacher's matrices.

In the beginning teacher's group, teacher number 150, a sixth grade male teacher, had the highest amount of Total Student Talk (50.33%). Also within the Student Talk categories his was the highest percentage in Student-Initiated Talk (36.71%), Category 9. In contrast to this he had the lowest amount of Indirect Teacher Talk (21.88%) and the highest percentage of Direct Teacher Talk (17.44%) within the group.

Display 12 shows the K-S test comparison of the shape of the proportions between the teachers in the above-average classroom reading teachers. In general these teachers seem to exhibit extremely similar verbal interaction patterns. There are not as many significant differences among this group as there was in the beginning teachers group. In the beginning teachers group all of the teachers were significantly different at least once, wherein the experienced teachers only four of the six teachers showed any significant difference.

Of the four experienced teachers who were different, the difference can be narrowed down to one teacher. Only one teacher, a sixth grade male, was different when compared to three other teachers. He did not differ from two of the other experienced teachers. The major difference for this individual was he had the highest Teacher Talk (47.01%) and

the lowest Student Talk (48.47%) of all the experienced teachers. He also had the highest use of Praise and Encouragement (8.67%) and the highest amount of Asking Narrow Questions (8.76%) in this group of teachers. See Appendix D for the category totals of all of the experienced teachers.

DISPLAY 12

A COMPARISON BETWEEN TEACHERS WITHIN THE EXPERIENCED TEACHERS GROUP USING THE KOLMOGOROV-SMIRNOV TEST.

Teacher Number	Teacher Number	Chi square value From K-SD	Level of Significance
520	530	.958	N.S.
520	540	4.275	N.S.
520	550	11.480	.01
520	560	1.264	N.S.
520	570	1.258	N.S.
530	540	4.398	N.S.
530	550	9.750	.01
530	560	1.358	N.S.
530	570	1.220	N.S.
540	550	5.876	N.S.
540	560	4.240	N.S.
540	570	1.274	N.S.
550	560	8.266	.05
550	570	5.139	N.S.
560	570	3.080	N.S.

Other Areas of Analysis

Analysis of S/T Ratio, I.D. Ratio and Revised I.D. Ratio, Variables 17, 19 and 20

The S/T Ratio, Variable #17

The S/T ratio is the relationship between the Total Teacher Talk and the Total Student Talk. It is computed by dividing the total number of tallies in the Teacher Talk categories into the total number of tallies in the Student Talk categories. If the ratio is above 1.00, then it indicates there is more Student Talk than Teacher Talk. If the ratio is 2.00 it indicates there is twice as much Student Talk as Teacher Talk. If it falls below 1.00 then it shows there was more Teacher Talk than Student Talk.

The I.D. Ratio, Variable #19

The I.D. ratio is the relationship between indirect teacher talk and direct teacher talk. An I.D. ratio of 1.00 means there was equal indirect and direct teacher talk. As this ratio becomes larger it indicates more indirect teacher talk is being used. If the ratio falls below 1.00, it indicates there is more direct teacher talk than indirect.

The Revised I.D. Ratio , Variable #20

The revised I.D. ratio is employed in order to find out the kind of emphasis given to motivation and control in the classroom. This variable eliminates the effects of Categories 4 and 40, Asking Questions and Category 5, Lecturing and gives information about whether the teacher is direct or indirect in his approach to motivation and control. The ratio indicates that as the value increases a greater amount of student centered motivation is being used instead of teacher control.

Display 13 indicates that all of the experienced teachers had S/T ratios over 1.00, which means that in every reading lesson the students talked more than the teachers. Only two of the beginning teachers had S/T ratios over 1.00.

When discussing the I.D. ratio and the Revised I.D. ratio, it should be kept in mind that it has already been determined that the experienced teacher spends less time in teacher talk activities during the "story review" phase of the Guided Reading Activity.

The beginning teachers exhibit some consistency in their I.D. ratios in that all but one of the teachers had I.D. ratios over 2.00 which indicates there was more than twice as much indirect teacher talk as direct teacher talk. Only two of the six experienced teachers had I.D. ratios over 2.00. The mean I.D. ratio for the beginning teachers was 2.27 and the mean I.D. for experienced teachers 1.89.

The Revised I.D. ratio is again a comparison of indirect and direct teacher talk except the questioning categories (4 and 40) are taken out of the indirect figure and the lecturing category (5) is taken out of the direct figure. The beginning teachers exhibited a consistency here also in that all but one of the teacher's Revised I.D. ratios increased. In the case of the experienced teachers the Revised I.D. ratios varied a great deal. Two experienced teachers Revised I.D. rose to over 3.00 which indicates that these teachers used three times as much student-centered motivation as they did student control techniques. One experienced teacher dropped below the 1.00 level which indicates she uses more student control techniques than she does student-centered motivational activities.

Again, the mean Revised I.D. ratio was lower for the experienced teachers than the beginning teachers.

DISPLAY 13

A COMPARISON OF BEGINNING AND EXPERIENCED TEACHERS
S/T RATIOS, I.D. RATIOS AND REVISED I.D. RATIOS

Teacher Number	S/T Ratio	S/T Mean	I.D. Ratio	I.D. Mean	Revised I.D. Ratio	Revised I.D. Mean
			Beginning Teachers			
110	.87		2.68		3.18	
120	.93		2.78		3.20	
130	1.39	1.06	2.03	2.27	2.93	2.74
140	.85		2.65		2.40	
150	1.28		1.25		1.97	
			Experienced Teachers			
520	1.26		2.94		3.64	
530	1.18		1.26		2.02	
540	1.81	1.40	1.44	1.89	.80	2.31
550	1.03		1.28		1.77	
560	1.82		2.57		4.20	
570	1.28		1.86		1.44	

In summary, the data in Display 13 tells us that the beginning teacher had more of a teacher centered reading lesson in reading than the experienced teacher. But the teacher centered situation was of a more indirect teacher talk pattern for the beginning teachers than the experienced teachers. It is important to keep in mind that these are only trends and cannot be considered as significant differences.

Analysis of the Flexibility Factors, Variables 18, 29, 30 and 31

Flexibility Factor 1 (V#18) is the number of cells used in the total matrix. This represents the total number of different interactions that have taken place. In every flexibility factor case, the larger the number, the more types of interactions have been utilized.

Flexibility Factor 2 (V#29) is a count of the number of cells that have tallies in them in those categories related to teacher talk and student motivation. This is the total number of cells used in categories, 11, 1, 2 and 3.

Flexibility Factor 3 (V#30) is the number of cells used in categories 6, 60, 7 and 70. These are the categories related to teacher talk and control of students.

Flexibility Factor 4 (V#31) is the total number of cells used in the student talk categories, 8, 80 and 9.

Display 14 gives a graphic picture of the comparisons of the four flexibility factors. An examination of this data produced no

significant results. A rather consistent trend can be seen in that the experienced teachers as a whole are more flexible in every case. As previously stated the beginning teachers used a slightly more indirect approach than the experienced teacher during teacher talk activity. It is interesting to note though, the experienced teachers in actual time were less indirect but these same teachers used a greater number of types of interactions while being indirect. This tends to indicate that the more experienced a teacher becomes, the more variety of verbal interaction she utilizes.

DISPLAY 14

A COMPARISON OF FLEXIABILITY FACTORS BETWEEN BEGINNING TEACHERS AND EXPERIENCED TEACHERS.

	Flexibility Factor (FF)			
Teacher Number	FF-1 Total Matrix	FF-2 Revised Indirect	FF-3 Revised Direct	FF-4 Student Talk
		Beginning Teachers		
110	92	17	15	23
120	107	19	14	25
130	106	19	17	27
140	111	20	13	28
150	79	10	10	20
		Experienced Teachers		
520	116	23	21	26
530	126	24	24	31
540	114	17	20	36
550	100	16	13	30
560	91	14	12	25
570	84	11	16	23

Analysis of Selected Areas, Variables 23, 24, 25, 26, 27, 28, 41 and 42

All of the data in these selected areas are presented in the form of percentages except variable number 25 which is a ratio of two percentages (V#23 and V#24).

Extended Indirect Teacher Talk (V#23).

This area indicates prolonged accepting behavior on the part of the teacher. This includes extended acceptance of ideas, behavior and feelings, as well as transitions from one of these patterns to another.

Extended Direct Teacher Talk (V#24)

These cells represent the teacher's emphasis on criticism, correction, direction giving or moving from one of these types of influence to the other. Total percentage in this area suggests extended direct influence on the part of the teacher and a heavy focus on the teacher's use of authority.

Ratio of Extended Indirect and Direct Teacher Talk (V#25)

This ratio represents the relationship between extended indirect and direct teacher talk. As this ratio increases over 1.00, it indicates an increase in extended indirect teacher influence. If the number is below 1.00, then that teacher is using more extended control and authority techniques than acceptance of student behaviors.

Steady State Cells - Indirect Teacher Talk (V#26)

Tallies are recorded in these cells only if the behavior lasts for more than three seconds. These cells identify continuous talk in a single category. In this variable these categories are those related to teacher talk which is indirect in nature.

Steady State Cells - Direct Teacher Talk (V#27)

These cells identify continuous teacher talk in single categories. In this variable these categories are those related to teacher talk which is direct in nature.

Extended Student Talk (V#28)

This area represents prolonged student verbal behavior. These cells indicate continuous talk by the students. This area has no teacher talk data in it.

Teacher Response to Student Talk (V#41)

This area indicates the percent of time spent by teachers responding to the students. A comparison of the percentage of tallies in this area indicates the pattern of behavior used by the teacher in response to students at the moment that a student stops talking.

Student Response to Teacher Talk (V#42)

This area indicates the percent of time spent by the students responding initially to teacher talk. A comparison of the percentage of tallies in this area indicates the pattern of behavior used by the students in response to teachers at the moment that the teacher stops talking.

Several of the areas shown in Display 15 are so similar that no trends can be determined. These areas are Steady State Cells-Direct, Teacher Response to Student Talk, Steady State Cells-Indirect, and Student Response to Teacher Talk.

The areas which do show a trend are interrelated. The experienced teachers have almost one-third again as much student talk, 29.76%, as compared to the beginning teachers, 20.08%. When a shift is made to compare the teacher talk activity, the Extended Indirect-Direct Ratio indicates that the beginning teachers had twice as many tallies in the Extended Indirect area as the experienced teachers. This is somewhat meaningless though when a consideration is given to the size of the percentages in this area, 2.59% of the total matrix.

DISPLAY 15

MEAN PERCENTAGES OF TALLIES IN SELECTED AREAS OF ANALYSIS FOR THE BEGINNING AND EXPERIENCED TEACHERS

Variable Number	Variable Description	Mean Percentages Beginning Teachers N=5	Mean Percentages Experienced Teachers N=6
23	Extended Indirect Teacher Talk	2.59	1.59
24	Extended Direct Teacher Talk	1.48	1.91
26	Steady State Cells-Indirect	2.74	2.27
27	Steady State Cells-Direct	5.67	5.69
28	Extended Student Talk	20.08	29.76
41	Teacher Response to Student Talk	19.76	18.08
42	Student Response to Teacher Talk	19.83	17.65
25	Ratio of $\frac{\text{Extended Indirect}}{\text{Extended Direct}}$	1.75	.83

Analysis of Theoretical Conceptual Models, Variables 34, 35, 36, 37 and 39

An attempt was made to develop what might be considered as a "Good" Model and a "Bad" Model of verbal interaction for teachers during the reading exercise. The rationale for the selection of the specific cells to be included in these models were taken from several previous studies on what types of verbal behavior seem to be best for increased student achievement and attitued. (Amidon and Flanders, 1963; Amidon and Giammattea, 1965; Amidon and Hough, 1967; Flanders 1964 and 1965; Furst and Amidon, 1965; Hamachek, 1969; LaShier, 1967; and Siegel, 1967.)

G Model Percentage, Variable 34

This group of cells represents patterns which allow the students greater freedom of expression, increased teacher praise and acceptance of student ideas and broad questioning procedures. The G-Model value indicates the total percentages from 21 individual cells. See Appendix B for a list of specific cells. Comparisons would have to be made in relation to what other teachers scored in the model.

G Model Percentage Plus, Variable 35

This area is the total percentage of the cells in the G-Model plus the column percentage total for categories 40, Asking Broad Questions and 9, Student Initiated Talk.

B Model Percentage, Variable 36

This group of cells represents an attempt to deprive the students of freedom of expression, increase use of teacher authority and the asking of narrow questions.

B Model Percentage Plus, Variable 37

This value is the total percentage of the cells in the B-Model plus the column percentage total for categories 5, Teacher Lecture and 7, Teacher criticism and justification of authority.

Model Indirect Ratio MID, Variable 39

This variable is similar to the I.D. ratio previously referred to. It divides category totals from the B-Model into category totals of the G-Model. This ratio can be compared the same as the I.D. ratios, if the value goves over 1.00 it indicates that the teacher is using more of the "Good" Model categories than the "Bad" Model categories.

Display 16 presents the data related to the models. This analysis favors the experienced teachers. The G-Model and G-Model Plus values were consistently higher for the experienced teachers and the B-Model and B-Model Plus values were consistently lower. Also the MID ratios for the experienced teachers were higher. None of these values, though, are significantly different.

DISPLAY 16

A COMPARISON OF THE MODEL VARIABLES
BETWEEN EXPERIENCED AND BEGINNING TEACHERS

Teacher Number	G-Model %	G-Model+ %	B-Model %	B-Model+ %	MID Ratio
		Beginning Teachers			
110	39.38	76.01	22.03	30.24	1.55
120	36.33	74.99	20.08	28.00	1.46
130	44.35	81.26	17.94	26.92	1.75
140	20.21	38.43	25.51	31.25	.96
150	45.02	88.03	27.32	41.43	1.65
		Experienced Teachers			
520	57.57	113.63	13.31	21.30	3.18
530	49.20	101.44	16.19	30.38	2.29
540	31.94	62.16	19.95	24.86	1.19
550	30.05	58.77	24.61	37.89	1.06
560	50.77	106.77	15.52	22.91	2.21
570	37.71	73.57	22.10	28.94	1.32

Ranking of Cells, Variable 32

The individual cells for each teacher's matrix is ranked from most frequently used to least frequently used. Only the first ten most frequently used cells are examined in this analysis.

Display 17 shows the ranking of the cells. The most frequently used cell of all the teachers, both experienced and beginning, except one is the 9-9 cell, the Steady State cell of Student Initiated Talk. The one teacher, a beginning teacher, who did not have the 9-9 cell as top had this cell ranked as fourth.

Due to the fact that there is no significant difference between the two groups of teachers, the frequency of positions of individual cells will be discussed across all eleven teachers instead of breaking them down into two separate groups.

An examination of Display 17 indicates there are two common reoccurring verbal patterns. One pattern is a situation which is often found in many classrooms. This pattern is: 4 - 8 → 8 - 2 → 2 - 4. In verbal interaction this becomes: Teacher asks narrow cognitive-type question (4); then student responds to teacher qustion with predictable answer (8); then teacher praises student for his response (2); then teacher asks another narrow question. This pattern is very common in most elementary classrooms in this locale.

The second pattern which emerges from the data on the study's eleven teachers is: 40 - 9 → 9 - 9 → 22 - 9 → 9 - 22 → 9 - 2 or 9 - 3. In the verbal interaction terms this becomes: Teacher asks

DISPLAY 17

RANKING OF INDIVIDUAL CELLS AND THEIR PERCENTAGE
FOR EACH OF THE BEGINNING AND EXPERIENCED TEACHERS

Rank		Teachers Code 110	120	130	140	150	520	530	540	550	560	570
1	Cell Code	9-9	9-9	9-9	4-8	9-9	9-9	9-9	9-9	9-9	9-9	9-9
	Percentage	(15.57)	(13.90	(14.37)	(10.17)	(19.33)	(22.97)	(20.27)	(14.63)	(13.77)	(35.46)	(20.66)
2	Cell Code	4-8	40-9	22-9	80-80	22-9	40-9	40-9	80-80	80-80	8-80	4-8
	Percentage	(6.97)	(6.03)	(10.03)	(9.73)	(8.47)	(7.83)	(7.00)	(14.33)	(12.23)	(6.73)	(9.43)
3	Cell Code	9-2	4-8	9-22	8-2	4-8	22-9	5-5	33-33	4-8	4-8	33-33
	Percentage	(6.17)	(7.63)	(9.17)	(7.27)	(8.40)	(6.07)	(6.47)	(7.73)	(6.83)	(5.67)	(6.10)
4	Cell Code	8-2	8-2	4-8	9-9	5-5	9-22	22-9	4-8	5-5	11-9	8-2
	Percentage	(5.07)	(3.93)	(7.53)	(5.80)	(8.37)	(5.57)	(6.30)	(6.37)	(6.00)	(4.77)	(5.90)
5	Cell Code	5-5	9-3	80-80	2-4	9-22	9-2	9-22	22-9	8-2	40-9	80-80
	Percentage	(4.60)	(3.77)	(7.07)	(4.93)	(6.93)	(5.20)	(6.07)	(5.90)	(5.13)	(4.13)	(4.10)
6	Cell Code	22-9	11-9	5-5	22-80	40-9	4-8	9-5	9-22	40-9	5-5	22-9
	Percentage	(3.80)	(3.27)	(3.70)	(3.37)	(4.43)	(4.77)	(3.87)	(5.27)	(4.83)	(4.00)	(3.70)
7	Cell Code	40-9	5-5	40-9	80-22	80-80	9-40	5-9	6-6	9-2	9-2	2-4
	Percentage	(3.77)	(2.60)	(3.07)	(3.30)	(2.47)	(3.17)	(3.33)	(2.40)	(2.70)	(2.77)	(3.40)
8	Cell Code	11-9	9-2	8-2	40-9	8-2	5-5	4-8	40-8	2-5	40-40	9-22
	Percentage	(3.70)	(2.37)	(2.83)	(3.17)	(2.40)	(2.73)	(3.33)	(2.33)	(2.47)	(2.40)	(3.17)
9	Cell Code	9-22	22-9	9-2	9-3	5-4	9-3	9-40	8-8	5-4	9-40	40-9
	Percentage	(3.30)	(2.27)	(2.47)	(2.80)	(2.37)	(2.60)	(3.17)	(2.10)	(2.43)	(2.00)	(2.63)
10	Cell Code	2-4	9-40	2-4	9-2	9-5	40-40	9-3	8-4	2-4	9-4	5-5
	Percentage	(2.77)	(2.03)	(2.33)	(2.67)	(2.33)	(2.50)	(2.93)	(1.87)	(2.10)	(1.93)	(2.33)

broad questions which allow students freedom of expression or higher thought level responses (40); then the student responds with an indepth response and continues to talk for an extended period of time exceeding three seconds in length (9-9); then another student talks without having to be prompted by the teacher; thus producing a free interchange of ideas and a student centered discussion (9-22, 22-9); then the teacher either praises the students for their responses (2) or accepts their ideas and uses them in the reading lesson.(3) This pattern based on the percentage of time it consumes is the most common occurring verbal interation behavior for these eleven classroom teachers during the "story review" phase of the Guided Reading Activity.

Some additional trends emerged when further ranking of the cells from the two master composite matrices were developed. Display 8, shows only the top ten most frequently used cells from the two groups of teachers. When this was extended to the top 30 most frequently used cells it was found that 23 individual cells were common to both groups of teachers. Also these 23 common cells represented 70.63% of the Beginning teacher's lessons and 72.54% of the experienced teachers total composite matrix. This means that for the beginning teachers the other 29.37% of their time was spread out over 119 other individual cells or an average of one-fourth of one percent (.25%) per cell. For the experienced teachers 27.46% of their time was spread over 149 other cells or an average of about one-fifth of one percent (.18%) per cell.

The following circular verbal interaction pattern, a linking of the two patterns previously discussed, 40-9 → 9-9 → 9-22 → 22-9 → 9-2 → 2-4 → 4-8 → 8-2 → 2-40 represented 46.65% of the beginning teacher's time and 47.45% of the experienced teacher's time. When two additional steady state cells which were frequently used and appeared in the top ten cells of both groups; cell 5-5, Teacher Talk-extended lecturing and cell 80-80, Student Talk-extended oral reading; the total times rose to 55.27% of the matrix for the beginning teachers and 56.95% of the experienced teacher's time. This demonstrates the influence which only 11 cells had on the verbal interaction patterns of these two groups of teachers.

The conclusion would have to be drawn from this analysis of individual cells that even if the two groups of teachers had been significantly different overall in their verbal patterns, this difference would have to be related to individual cells which represented less than 3.00 % of the total lessons. With the major verbal patterns being so similar and the differences in patterns so small it would have been almost impossible to develop a conceptual model of verbal interaction analysis that could have been considered the psychological ownership of the experienced teachers.

CONCLUSIONS

The major goal of this project was to determine if a difference existed in the verbal interaction patterns between beginning teachers and teachers identified as above-average classroom reading teachers by their building administrators. If there was a significant difference between the groups and if the experienced teacher had similar verbal behaviors, then a conceptual model of these verbal interactions would be developed. The data collected on the teachers in this study indicated that there was no significant differences between these two groups. For this reason it is not possible to construct a conceptual model related to the experienced teacher group.

This lack of significance may be due to a number of different reasons. Possibly, as many previous studies have shown, there is no one conceptual model related to the teaching process even on a fairly limiting learning situation as the "story review" phase of the Guided Reading Activity. It could be the selection and size of the two sample groups was not sophisticated enough to identify the two groups to be studied. Perhaps the level of socio-economic community and school district in this study was too high and that this district's personnel and hiring practices net a higher quality of beginning teachers than most districts would have.

Even though the two groups as a whole did not differ significantly there were some trends which emerged from the study.

Two categories showed slight trends in separating the two groups of teachers. The beginning teachers had a higher percentage of category 4, Asking Narrow Question than the experienced teachers. The experienced teachers allowed the students more freedom of expression as indicated by the slightly larger percentage of Student Talk-Initiated, category 9.

The above-average teachers in general had more student talk, 52.71% in the reading sessions than the beginning teachers, 46.26%. When the teachers were engaged in Teacher Talk activities, the beginning teachers used a slightly higher percentage of Indirect Teacher Talk, 30.88%, than the experienced teachers, 23.77%. These patterns reaffirmed themselves when some of the other variables were analyzed; greater S/T Ratio for the experienced teachers; differences in I.D. and Revised I.D. Ratios favoring the beginning teachers, and a larger Extended Indirect area for the beginning teachers.

When a within group analysis was made of the two groups of teachers, it was found that the experienced teachers were more alike within their group than the beginning teachers were within their group. This seems to indicate that beginning teachers start with or try a variety of verbal patterns during the reading lesson and that as time passes and they become experienced teachers, a single more common verbal behavior is used during this teaching time.

This pattern that the experienced teachers use includes a greater variety of types of interactions. This was demonstrated by the analysis of Flexibility Factors, a count of the total number of cells used in a matrix, in which the experienced teachers used a consistently greater number of types of interactions than did the beginning teachers.

The most common cell pattern used by both groups of teachers was: 40 - 9→9 - 9→22 - 9→9 - 22→9 - 2 or 9 - 3. In terms of specific verbal behavior, this represents: Teacher asks broad questions which allow students freedom of expression or higher thought level responses (40); then the student responds with an indepth response and continues to talk for an extended period of time exceeding three seconds in length (9-9); then another student talks without having to be prompted by the teacher; thus producing a free interchange of ideas and a student centered discussion (9-22, 22-9); then the teacher either praises the students for their responses (2) or accepts their ideas and uses them in the reading lesson.(3)

The second most common pattern found in these teacher's verbal patterns (4 - 8→8 - 2→2 - 4) is one which is often found in the elementary classrooms in the district in which the study was carried out.

Even though the results of this project did not achieve the desired objectives, it did discover some trends related to the "story review" phase of the Guided Reading Activity in grades three through six. It is hoped that this is not the end of this quest for a conceptual model approach to improve the teaching of reading in the elementary schools.

RECOMMENDATIONS

Recommendations for Further Research

This study should be duplicated with the following changes:

A. Increase the number of teachers in each of the sample sizes.
B. Select a school district of a different socio-economic level.
C. Determine a different approach or criteria for selection of teachers for the above-average group. Some other techniques for selection of teachers for this group are:
    1. Peer nomination and selection. Other teachers or professional educators that are familiar with possible candidates could determine a common set of criteria for appointment to this group.
    2. Trend line analysis of student achievement. A trend line data analysis study could be carried out on a large group of teachers. The students' reading achievement score gains could be determined over a period of years for individual teachers, and those teachers who demonstrate that their students are gaining significantly more than an expected or anticipated amount could be selected.
    3. Selected Measurement Instruments. There are several instruments that measure select teacher performance levels which might be used to determine this type of teachers. Some instruments that might be used are: I.O.T.A., "Teaching Tasks in Reading"(Turner, 1960) or Teacher Characteristics Schedule (Turner, 1967).

Another possible study might be to borrow Dwight Allen's micro-teaching technique or Stanford's Center for Research and Development in Teaching Technical Skill program and use this avenue to teach reading lessons using theoretically developed conceptual models. This could be done by selecting a group of students, pre-testing the students as to their achievement level on a particular lesson, teach these students using the micro-teaching or technical skills teaching techniques of control and observation and performing the lesson using a predetermined verbal interaction conceptual model, and then post-testing the students to determine their levels of gains in achievement. This process could be repeated using different verbal interaction conceptual models until a particular one can be shown to produce significant gains in student achievement in reading.

APPENDIXES

APPENDIX A

VERBAL INTERACTION ANALYSIS FORTRAN PROGRAM

```
                                                                                    02/03/70
/ID 001001
/JOB GO
/FTC LIST
/FTC                                                                                02/03/70
BPS FORTRAN D COMPILER
          C  VERBAL INTERACTION ANALYSIS PHASE 100 -- MATRIX DEVELOPMENT              VIANAL01
          C     WRITTEN 11/20/69                                                      VIANAL01
          C                                                                           VIANAL01
S.0001              INTERGER ARRAY(20,20),FLD(35), ROW, COL, CARD, PRNTR, BTCHNO     VIANAL01
S.0002              INTERGER TOTAL (20)                                             VIANAL01
S.0003              DIMENSION ITEM(1400), IDCAT(20), HONG(35),PRCNT(20)             VIANAL01
S.0004              CARD = 5                                                        VIANAL01
S.0005              PRNTR = 6                                                       VIANAL01
          C  READ MATRIX SIZE & CATEGORY DESIGNATIONS                               VIANAL01
S.0006              READ (CARD, 100) IMAX, (IDCAT(I), I = 1, IMAX)                  VIANAL01
S.0007    100       FORMAT (2112)                                                   VIANAL01
S.0008              IF (IMAX - 21) 1, 2, 2                                          VIANAL01
S.0009    2         WRITE (PRNTR, 300)                                              VIANAL01
S.0010    300       FORMAT ('I MAXIMUM MATRIX SIZE IS 20 X 20.')                    VIANAL01
S.0011              STOP 99998                                                      VIANAL01
          C                                                                         VIANAL01
          C  READ HEADING CARD                                                      VIANAL01
          C                                                                         VIANAL01
S.0012    1         READ (CARD, 101)  (HDNG(I), I = 1, 35), LINENO, BTCHNO          VIANAL01
S.0013    101       FORMAT (35A2,4X,12,14)                                          VIANAL01
          C                                                                         VIANAL01
S.0014              IF (LINENO) 1, 3, 1                                             VIANAL01
          C                                                                         VIANAL01
S.0015    3         LINE = 1                                                        VIANAL01
S.0016              N = 1                                                           VIANAL01
          C
```

```
                C  READ DETAIL DATA CARD                                                VIANAL01
                C                                                                       VIANAL01
S.0017          200   READ (CARD, 102)  (FLD(I), I = 1, 35), LINENO, KEY               VIANAL01
S.0018          102   FORMAT (3512, 4X, 12, 14)                                       VIANAL01
                C                                                                       VIANAL01
S.0019                IF (KEY - BTCHNO) 4, 5, 4                                       VIANAL01
S.0020          4     WRITE (PRNTR, 301) BTCHNO, LINENO, KEY                          VIANAL01
S.0021          301   FORMAT('1 INVALID CARD IN DATA SET '15'. CHECK LINE NUMBER '13' WH VIANAL01
                     1ICH IS IDENTIFIED AS DATA FOR ANALYSIS'15'.')                     VIANAL01
S.0022                GO TO 1                                                         VIANAL01
                C                                                                       VIANAL01
S.0023          5     IF (LINENO - LINE) 6, 7, 6                                      VIANAL01
S.0024          6     WRITE (PRNTR, 302) KEY, LINENO                                  VIANAL01
S.0025          302   FORMAT ('1 IMPROPER CARD SEQUENCE IN DATA SET FOR ANALYSIS NUMBER ' VIANAL01
                     1I5'. CHECK CARD IDENTIFIED WITH LINE NUMBER'13'.')             VIANAL01
S.0026                GO TO 1                                                         VIANAL01
                C                                                                       VIANAL01
                C  CHECK DATA AND CONVERT FROM VIA CATEGORY DESIGNATION TO INTEGER       VIANAL01
                C                                                                       VIANAL01
S.0027          7     LINE = LINE + 1                                                 VIANAL01
S.0028                L = 1                                                           VIANAL01
S.0029          8     I = 1                                                           VIANAL01
S.0030          9     IF (FLD(L) - IDCAT(I) 10, 11, 10                                VIANAL01
S.0031          10    IF (I - IMAX) 12, 13, 13                                        VIANAL01
S.0032          12    I = I + 1                                                       VIANAL01
S.0033                GO TO 9                                                         VIANAL01
S.0034          13    IF (FLD(L) - 99) 14, 16, 14                                     VIANAL01
S.0035          14    WRITE (PRNTR, 303) L, LINENO, KEY, FLD(L)                       VIANAL01
S.0036          303   FORMAT ('1 INVALID ENTRY IS ITEM '13' ONE LINE NUMBER '13' OF DATA S VIANAL01
                     1ET FOR ANALYSIS NUMBER '15'.'/'0 THE ENTRY HAS BEEN READ AS '13'.) VIANAL01
S.0037                GO TO 1                                                         VIANAL01
                C                                                                       VIANAL01
S.0038          11    ITEM(N) = I                                                     VIANAL01
S.0039                N = N + 1                                                       VIANAL01
S.0040                IF (N - 1400) 20, 20, 30                                        VIANAL01
```

```
S.0041      30    WRITE (PRNTR, 310) KEY
S.0042      310   FORMAT ('1 MORE ENTRIES HAVE BEEN MADE FOR THE DATA SET IDENTIFIED
                  1 AS' 15 ', THAN CAN READILY BE PROCESSED BY THIS PROGRAM.'/' PLEAS
                  2E CONSULT A FORTRAN PROGRAMMER FOR INFORMATION CONCERNING PROGRAM
                  3MODIFICATIONS TO HANDLE YOUR DATA.')
S.0043            GO TO 1
S.0044      20    IF (L - 35) 15, 200, 200                                    VIANAL01
S.0045      15    L = L + 1                                                   VIANAL01
S.0046            GO TO 8                                                     VIANAL01
            C                                                                 VIANAL01
            C  DEVELOP VIA MATRIX                                             VIANAL01
            C                                                                 VIANAL01
S.0047      16    DO 17 M5 = 1, 20
S.0048            DO 17 M6 = 1, 20
S.0049      17    ARRAY (M5,M6) = 0                                           VIANAL01
S.0050            NUM = N - 2                                                 VIANAL01
            C                                                                 VIANAL01
            C   NUM = NUMBER OF ENTRIES IN MATRIX                            VIANAL01
            C                                                                 VIANAL01
S.0051            DO 50 M = 1, NUM, 1                                         VIANAL01
S.0052            ROW = ITEM(M)                                               VIANAL01
S.0053          COL = ITEM(M+1)                                               VIANAL01
S.0054      50    ARRAY(ROW,COL) = ARRAY(ROW,COL) + 1                         VIANAL01
            C                                                                 VIANAL01
            C  PRINT HEADINGS                                                 VIANAL01
            C                                                                 VIANAL01
S.0055            WRITE (PRNTR, 304) (HDNG(I), I = 1, 35), KEY,(IDCAT(J),J = 1, IMAX)  VIANAL01
S.0056      304   FORMAT ('1'46XR E A D I N G  L E S S O N'/34X'V E R B A L  I N  VIANAL01
                  1T E R A C T I O N  A N A L Y S I S'//25X35A2/45X'ANALYSIS IDENTIF  VIANAL01
                  2ICATION '15//' CATEGORY DESIGNATION-'14,1915 /)            VIANAL01
            C                                                                 VIANAL01
            C  PRINT A ROW OF THE MATRIX                                      VIANAL01
            C                                                                 VIANAL01
S.0057            DO 75 K = 1, IMAX, 1                                        VIANAL01
S.0058            WRITE (PRNTR, 305) IDCAT(K), (ARRAY(K,K1), K1 = 1, IMAX)    VIANAL01
```

```
S.0059      305   FORMAT (')'15X,13,2X,2015)                                          VIANAL01
S.0060            DO 70 K2 = 1, IMAX, 1                                               VIANAL01
S.0061      70    PRCNT(K2) = ARRAY(K,K2)*100.0/NUM                                   VIANAL01
S.0062      75    WRITE (PRNTR, 306) (PRCNT(K1), K1 = 1, IMAX)                        VIANAL01
S.0063      306   FORMAT (8X,'PERCENTAGES '20F5.2)
            C                                                                         VIANAL01
            C                                                                         VIANAL01
            C
            C  THIS SECTION COMPUTES COLUMN TOTALS
            C
S.0064            DO 490 I = 1, 20
S.0065      490   TOTAL (I) = 0
            C
S.0066            DO 500 L4 = 1, IMAX
S.0067            DO 501 L5 = 1, IMAX
S.0068      501   TOTAL(L4) = TOTAL(L4) + ARRAY(L5,L4)
S.0069      500   PRCNT(L4) = TOTAL(L4) * 100.0 / NUM
S.0070            WRITE (PRNTR, 307) NUM, (TOTAL(L5), L5 = 1, IMAX)
S.0071      307   FORMAT(') TOTALS ARE '16,2X,20I5)
S.0072            WRITE (PRNTR, 306) (PRCNT(K1), K1 = 1, IMAX)
            C
            C*************************************************************************************************
            C
            C  THE FOLLOWING CODING PRODUCES SUMMARY DATA
            C
S.0073            DO 505 I = 2, 6
S.0074      505   PRCNT(1) = PRCNT(1) + PRCNT(I)
S.0075            PRCNT(2) = 0
S.0076            CO 506 I = 7, 11
S.0077      506   PRCNT(2) = PRCNT(2) + PRCNT(I)
S.0078            PRCNT(3) = PRCNT(1) + PERCNT(2)
S.0079            PRCNT(4) = 0
S.0080            DO 507 I = 12, 14
S.0081      507   PRCNT(4) = PRCNT(4) + PRCNT(I)
```

```
S.0082            PRCNT(5) = 0
S.0083            DO 508 I = 15, 17
S.0084      508   PRCNT(5) = PRCNT(5) + PRCNT(I)
S.0085            WRITE (PRNTR, 308) (PRCNT(I), I = 1, 5)
S.0086      308   FORMAT('0 INDIRECT TEACHER TALK "F6.2'%'/'  DIRECT TEACHER TALK
                 1'F6.2'%'/'  TOTAL TEACHER TALK    'F6.2'%'/'0 STUDENT TALK'10XF6.2
                 2'%'/'0 NO TALK'15X F6.2'%' )
S.0087            SOVERT = PRCNT(4) / PRCNT(3)
S.0088            WRITE (PRNTR, 309) SOVERT
S.0089      309   FORMAT ('0 STUDENT/TEACHER RATIO ' F7.3)
            C
            C*****************************************************************************************************
            C                                                                                                VIANAL01
S.0090            GO TO 1                                                                                  VIANAL01
S.0091            END                                                                                      VIANAL01
                     SIZE OF COMMON  00000     PROGRAM   11340
END OF COMPILATION  MAIN
```

APPENDIX B

ANALYSIS VARIABLES

Variable Number	Name - Code Name	Interpretation
1	COL 1	Total column one
2	COL 2	Total column two
3	COL 3	Total column three
4	COL 4	Total column four
5	COL 5	Total column five
6	COL 6	Total column six
7	COL 7	Total column seven
8	COL 8	Total column eight
9	COL 9	Total column nine
10	No Talk - Total	Total of cols. 22 + 33 + 44 percentages
11	COL 11	Total column 11
12	Teacher Talk-Indirect TTI	Cols. 11 + 1 + 2 + 3 + 4 + 40
13	Teacher Talk-Direct TTD	Cols. 5 + 6 + 60 + 7 + 70
14	Teacher Talk TT	Percent teacher talk, Cols. 11 + 1 + 2 + 3 + 4 + 40 + 5 + 6 + 60 + 7 + 70
15	Student Talk ST	Percent student talk, Cols. 8 + 80 + 9
16	Matrix Cells	a. Raw score (# of tallies) b. Percentage in each cell
17	S/T Ratio	$\frac{\text{Student talk - total \%}}{\text{Teacher talk - total \%}}$
18	Flexibility Factor[1]	Number of cells in matrix with tallies
19	Big Indirect-Direct Ratio BID	$\frac{\text{Cols. 11 + 1 + 2 + 3 + 4 + 40}}{\text{Cols. 5 + 6 + 7 + 60 + 70}}$
20	Revised Indirect-Direct Ratio RID	$\frac{\text{Cols. 11 + 1 + 2 + 3 (Indirect)}}{\text{Cols. 6 + 7 + 60 + 70 (Direct)}}$

Variable Number	Name - Code Name	Interpretation
21	Indirect-Direct Ratio - Row 9	$\frac{\text{Cols. } 11 + 1 + 2 + 3 + 4 + 40}{\text{Cols. } 5 + 6 + 7 + 60 + 70}$
22	COL 22	Total column 22
23	Extended Indirect Area XIN	Cells 1-1 + 1-2 + 1-3 + 2-1 + 2-2 + 2-3 + 3-1 + 3-2 + 3-3 + 11-11 + 11-1 + 11-2 + 11-3 + 1-11 + 2-11 + 3-11
24	Extended Direct Area XDI	Cells 6-6 + 6-7 + 7-6 + 7-7 + 6-60 + 6-70 + 60-6 + 60-60 + 60-7 + 60-70 + 7-60 + 7-70 + 70-6 + 70-60 + 70-7 + 70-70
25	XINDI	$\frac{\text{XIN}}{\text{XDI}}$
26	Steady State Cells S11-40	Cells 1-1 + 2-2 + 3-3 + 4-4 + 11-11 + 40-40
27	Steady State Cells S5-70	Cells 5-5 + 6-6 + 60-60 + 7-7 + 70-70
28	Extended Student Talk EXTST	Cells 8-8 + 8-9 + 9-8 + 9-9 + 8-80 + 80-8 + 80-80 + 80-9 + 9-80
29	Flexibility Factor[2] IN Revised Indirect	Number of cells in cols. 11 + 1 + 2 + 3 with tallies
30	Flexibility Factor[3] DI Revised Direct	Number of cells in cols. 6 + 60 + 7 + 70 with tallies
31	Flexibility Factor[4] ST Student Talk	Number of cells in cols. 8 + 80 + 9 with tallies
32	Ranking of Cells	Rank cells as to the frequency (Hi to Lo)
33	COL 33	Total column 33
34	G Model Ratio	Total in Cells 2-40 + 3-40 + 3-60 + 40-40 + 40-9 + 40-3 + 60-80 + 60-33 + 80-9 + 9-2 + 9-3 + 9-9 + 9-22 + 22-9 + 33-80 + 33-9 + 2-60 + 3-3 + 2-3 + 3-2 + 2-2
35	G Model Ratio +	G model ratio + cols 40 + 9

Variable Number	Name - Code Name	Interpretation
36	B Model	Total in cells 4-4 + 4-8 + 4-33 + 4-44 + 5-4 + 5-5 + 5-6 + 6-6 + 6-80 + 7-4 + 7-5 + 7-6 + 7-7 + 8-4 + 8-5 + 8-6 + 8-7 + 8-70 + 8-44 + 80-5 + 80-7 + 80-70 + 8-8 + 80-44 + 9-7 + 44-7
37	B Model +	B model ratio + cols. 5 + 7
38	ID 8 + 80 + 9	$\frac{\text{Cols. } 11 + 1 + 2 + 3 + 4 + 40}{\text{Cols. } 5 + 6 + 7 + 60 + 70}$ (For rows 8 + 80 + 9)
39	MID	$\frac{\text{Cols. } 2 + 3 + 40 + 60 + 80 + 9 + 22 + 33}{\text{Cols. } 4 + 5 + 6 + 7 + 70 + 8 + 80 + 33 + 44}$
40	COL 40	Total column 40
41	Student Talk followed by Teacher Talk	Total % in cells 8-11 ← to → 8-70 80-11 ← → 80-70 9-11 ← → 9-70
42	Student talk after teacher talk	Total in cells 11-8 ← to → 11-9 1-8 ← → 1-9 2 ←→ 3 ←→ 4 ←→ 40 ←→ 5 ←→ 6 ←→ 60 ←→ 7 ←→ 70-8 ← → 70-9
43	KS Test 1	The column category ratios for each of 11 matrices will be compared with the Kolmogorov-Smirnov test for significant differences.
44	COL 44	Total column 44
45	MWU Test	Mann Whitney U test for each of 17 categories of two groups of teachers
46	KS Test 2	The Kolmogorov-Smirnov test will be used to compare the two master composite matrices
60	COL 60	Total column 60
70	COL 70	Total column 70
80	COL 80	Total column 80

APPENDIX C

TOTAL PERCENTAGES FOR EACH SEPARATE CATEGORY FOR INDIVIDUAL BEGINNING TEACHER

Category	Teachers Code Numbers 110 %	120 %	130 %	140 %	150 %
11	5.33	5.40	1.41	3.27	.14
1	.30	.17	.63	.20	.07
2	12.14	6.60	5.97	10.58	4.40
3	2.64	5.57	4.04	5.33	2.10
4	10.33	9.03	8.70	13.19	8.87
40	5.43	8.83	3.54	4.15	6.30
5	7.07	7.24	7.81	5.74	14.04
6	4.93	3.61	1.24	7.10	2.90
60	.34	0.00	.10	0.00	0.00
7	1.14	.68	1.17	0.00	.07
70	0.00	1.26	1.60	.97	.07
8	11.29	12.19	8.73	13.64	10.54
80	.77	2.87	8.10	15.24	3.08
9	31.20	29.83	33.41	14.07	36.71
22	4.10	2.24	10.37	4.04	8.47
33	2.83	4.67	2.14	2.98	.84
44	.20	.07	.40	0.00	0.00
Indirect Teacher Talk	36.17	35.60	24.25	36.72	21.88
Direct Teacher Talk	13.48	12.79	11.92	13.81	17.44
Total Teacher Talk	49.65	48.39	36.17	50.53	39.32
Total Student Talk	43.26	44.89	50.24	42.95	50.33

APPENDIX D

TOTAL PERCENTAGES FOR EACH SEPARATE CATEGORY FOR INDIVIDUAL EXPERIENCED TEACHER

Category	Teacher Code Numbers 520 %	530 %	540 %	550 %	560 %	570 %
11	1.26	2.04	1.11	1.73	2.90	.50
1	.56	.70	.30	0.00	0.00	0.00
2	7.17	2.34	3.06	8.67	4.54	7.96
3	4.06	4.43	1.87	2.74	3.40	2.92
4	5.90	4.02	7.39	8.76	7.64	9.97
40	11.39	9.88	4.21	4.48	7.01	3.59
5	6.73	13.86	4.51	13.21	7.32	5.50
6	1.81	3.02	6.41	5.81	1.74	6.13
60	.35	.49	.70	0.00	.14	0.00
7	1.26	.33	.40	.07	.07	1.34
70	.17	.87	.40	1.54	.63	.43
8	6.46	4.36	12.00	9.43	6.98	11.39
80	.16	2.85	16.97	14.80	8.54	5.48
9	44.67	42.36	26.01	24.24	48.99	32.27
22	6.34	6.54	6.13	1.74	1.24	3.67
33	1.24	1.23	9.10	.77	.81	8.53
44	0.00	.10	.10	.14	0.00	0.00
Indirect Teacher Talk	30.34	23.41	17.94	26.38	25.49	24.94
Direct Teacher Talk	10.32	18.57	12.42	20.63	9.90	13.40
Total Teacher Talk	40.66	41.98	30.36	47.01	35.39	38.34
Total Student Talk	51.29	49.57	54.98	48.47	64.51	49.14

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